Factors Influencing Children's Dietary Practices: A Review

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This article briefly reviews research on children's dietary practices and discusses factors that affect their food choices and behaviors. The influence of food preferences on actual food selections and key factors that determine preferences in children are explored. Special attention is given to feeding practices within the child-care setting because the number of meals and snacks consumed in day-care homes and centers continues to increase.

Researchers at the U.S. Department of Agriculture (USDA) Center for Nutrition Policy and Promotion (CNPP) used a multistage approach to develop the Food Guide Pyramid for Young Children. CNPP provided a research-based rationale for focusing on a food guide that could be used by parents and caregivers of preschool-age children (*43*). Using data from the Continuing Survey of Food Intakes by Individuals 1989-91, the Center developed composites for 1,300- and 1,600-calorie Pyramid-based diet patterns, all of which were based on children's food intake *(35)*.

To gather input from the target audience, USDA researchers conducted a two-phase focus group study to obtain participants' evaluations of the prototype graphic and promotional materials (*49*). CNPP staff conducted additional research to determine whether any other issues needed to be considered in developing and promoting a food guide for the target audience.

The early years are a key time for experimenting with and establishing dietary habits, some of which may have a major influence on the risk for developing certain chronic diseases later in life. Early experiences with food and eating are central to the acquisition of food preferences and patterns of food consumption (*6*). Children's food choices are further influenced by a wide variety of environmental and lifestyle factors (*16, 41*) that are important in the development, maturation, and modification of dietary behavior during childhood (*24*) and that are important determinants of dietary behavior among underserved, ethnically diverse groups of children (*13*). This paper briefly highlights several influences on young children's dietary behavior that may have implications for feeding as well as communicating food and nutrition messages to young children.

Developmental Capabilities and Children's Dietary Practices

Children's dietary practices are influenced by their developmental stage, with the years between 2 and 6 marked by rapid social, intellectual, and emotional growth. Physical growth slows overall, with a decrease in growth rate reflected in a decrease in appetite and less interest in food (*45*).

Adding to the challenge of feeding young children is the emotional growth

that takes place while they are toddlers. Toddlerhood marks the beginning of children's attempts to establish independence. As a result, children engage in power struggles with parents and caregivers. These conflicts often erupt during feeding situations, with toddlers refusing to eat until they get what they want and with adults torn between their need to control the situation and their desire to ensure that their child is well nourished.

As children progress into the preschool years, their emotional development continues to affect the feeding situation. Preschoolers are generally less fearful than toddlers and more eager to stretch their limits; to explore their world. They behave more consistently and are likely to be active in seeking attention and approval from adults. Thus their eating patterns become more established, and their food preferences are highly influenced not only by adults but also by peers (*45*). Birch found that children as young as 3 and 4 years could be persuaded to change their selection and consumption of different vegetables as a result of eating meals with their peer group whose preferences differed initially from their own (*3*). Furthermore, peer influence was strongest for the younger children in the group.

Preschool children also undergo major changes in development of their motor skills and other abilities. The progression from large motor skills to fine motor skills that occurs gives parents and caregivers a prime opportunity to engage children in food-preparation activities (*26,27*). Food preparation can be used to teach colors, shapes, sizes and size comparisons, cultural differences, and mathematical concepts (*45*).

Food Preferences and Acceptance and Children's Food-Related Behaviors

One estimate has indicated that 25 to 50 percent of the variation in food consumption among individuals can be attributed to preference alone (*38*). One study of young Mohawk children, for example, has found that food preferences explained over 70 percent of the variation in dietary behavior (*25*). Another study has provided evidence of a strong correlation between food preferences and food choices in children as young as 3 years. This research also suggests that food preferences may have an even greater effect on children's food choices than on adults' choices (*2*).

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Young children are capable of learning to like and accept a wide variety of foods, and this learning occurs rapidly during the first few years of life. Understanding the contribution of early learning and experiences to the development of food-acceptance patterns (e.g., which foods and how much of each an individual chooses to eat) can help foster development of healthful patterns and reduce parents' and caregivers' anxieties about feeding children (*6*).

Innate and Learned Factors

Development of food-acceptance patterns begins during infancy with certain innate taste preferences: newborn infants respond positively to sweet tastes and negatively to sour and bitter tastes. While the reflexive nature of infants' responses to these tastes might suggest that food-acceptance patterns are ''built-in'' and difficult to change, research does not support this conclusion (*8*). Responses to basic tastes change with a child's repeated experiences with foods.

One preference of young children, more learned than innate (it appears), is that for high-fat foods. Possible explanations for this preference for fat are the pleasant feeling of satiety it provides in response to hunger and its association in many foods containing sugar and salt, both of which are preferred tastes among children (*5*).

A preference for high-fat foods may have important implications for obesity among children. Research with a group of 3- to 5-year-old children found a correlation between their preferences for high-fat foods and both their total fat intake and triceps skinfold measurements (*20*). In addition, parents of children with the strongest preferences for high-fat foods and the highest total fat intakes had higher composite BMI scores than parents of children with lower scores.

Familiarity and Food Choices

Children tend to prefer foods that are familiar, compared with foods that are not, regardless of the foods' sensory characteristics (*48*). Birch et al. (*8*) have investigated children's tendency to reject what is new and how this tendency might be altered. The researchers' conclusion: changing rejection to acceptance can be as simple as providing a child with opportunities to sample a new food. However, having a child move from rejection to acceptance of new foods is a relatively slow process that may require as many as 10 exposures to a new food (*48*).

Building on previous research in this area, Skinner (*46*) found that 2- to 3-year-olds liked over 80 percent of food items that had been offered to them. She cautioned parents and caregivers to be careful about prejudging foods they think a child will not like or eat. She, instead, encouraged parents to do their best to expose children to a variety of nutritious foods to try and perhaps accept into their diet.

Other dimensions of foods that contribute to their ultimate acceptance or rejection by young children include smell, appearance, and textural characteristics (e.g., crunchiness, creaminess, and greasiness). However, children's responses to these characteristics are also influenced by their prior experiences with a food.

Family Preferences and Culture

The social context in which foods are presented also influences whether they are accepted: young children who observe adults eating a certain food are more likely to eat it. Likewise, using a food as a reward or presenting it with some attention from the adult also enhances a child's acceptance of it (*8*). But rewarding children for eating a certain food tends to decrease their acceptance of that food.

Skinner et al. (*46*) have found a strong relationship between the food preferences of toddlers and those of their mothers, fathers, and older siblings, but no family member appeared to have more influence than another had on children's preferences. Likewise, Burt and Hertzler (*14*) have found that mothers' and fathers' food preferences had a positive and equal influence on preferences of their 5- and 6-year-old children.

Other studies have also shown positive correlations between parents' and their young children's preferences, but the associations were not always significant and varied somewhat with children's ages (*4,14,39*). A meta-analysis of five studies demonstrated a small but significant correlation between the food preferences of parents and those of their children 2 to 24 years of age (*9*). The strength of the resemblance was similar for mothers' and fathers' preferences.

Studies of families' food preferences have identified factors in addition to parents' preferences that affect children's food preferences. Birch *(4)* concluded that the resemblances in food preferences of parents and those of 128 preschool children were at least partially explained by cultural similarities. However, other studies obtained somewhat different results. Pliner (*40*) found that the food preferences of children 24 to 83 months old matched those of their real family more closely than those of ''pseudo'' families (unrelated families from the same socioeconomic group).

Effects of Parental Concerns, Nutrition Knowledge, Beliefs, and Practices

Although research indicates that young children overall are likely to meet their nutrient needs, parents continue to express concerns about their children's dietary habits. In spite of the rise in childhood obesity, parents of young children are more apt to report being concerned about the perceived lack of food children consume than about the types of food consumed or the eating environment (*47*). Parents had several primary concerns about children's eating habits:

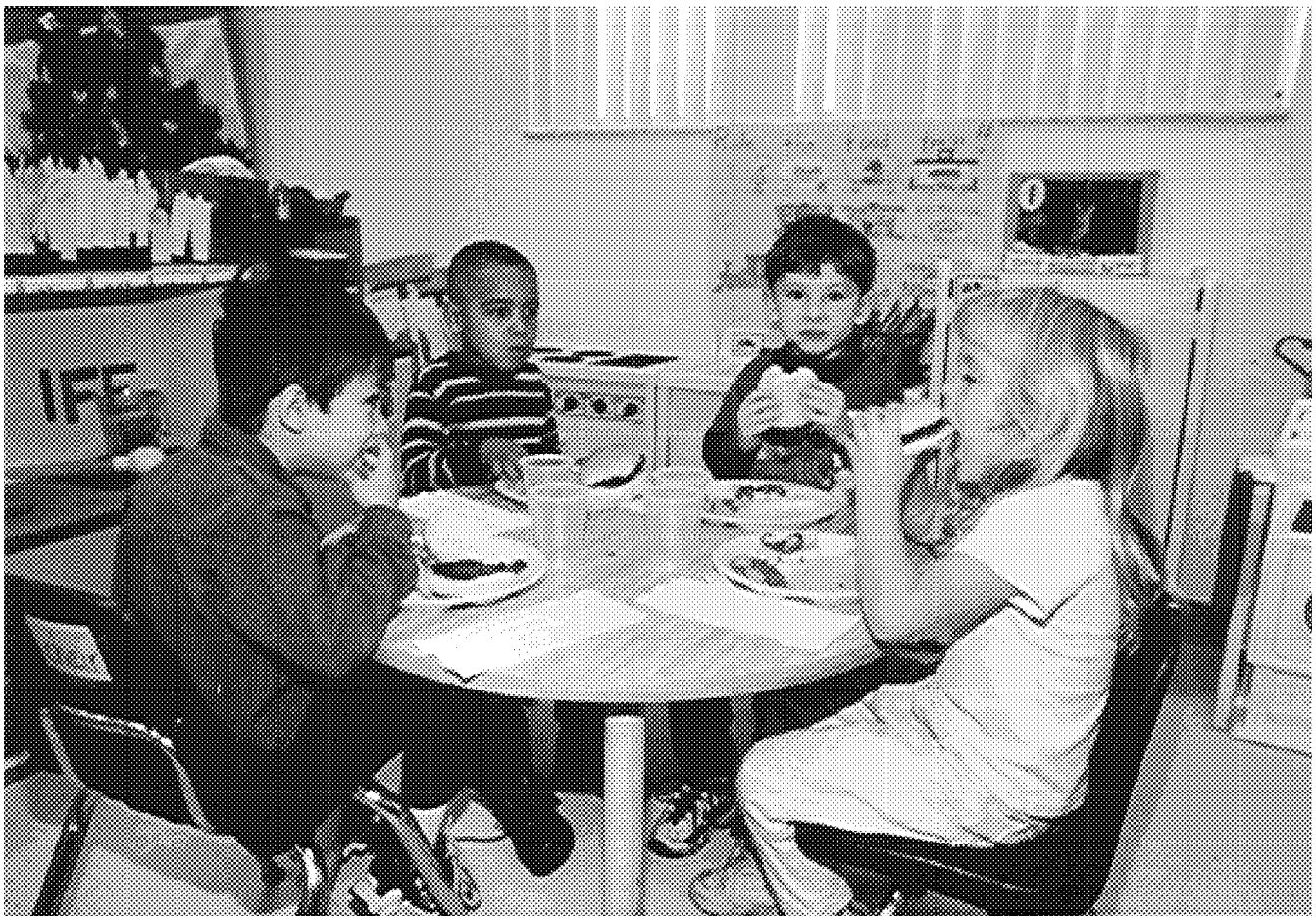
- Not eating enough. (Seventeen percent describe their child as a ''picky eater.'')
- Eating too many sweets.
- Eating a limited number of foods. (Meats and vegetables are most often disliked.)
- Not drinking enough milk.

Some studies have explored the effects of parents' nutrition knowledge on their children's knowledge and dietary practices. Contento et al. found that Latino mothers' nutrition knowledge and attitudes toward nutrition were positively correlated with nutrient intakes of their 4- to 5-year-old children (*15*). Kirks et al. (*31*) found that involving parents in a nutrition education program for primary-grade students increased the diversity and quality of students' diets. Furthermore, a 5-year follow-up with the same students showed that they continued to eat a better quality diet than students whose parents had not participated in the original nutrition education intervention (*32*). Thus parental involvement appeared to increase the family's overall nutrition knowledge as well as the likelihood that nutrition information would be integrated into family food-shopping and food-preparation practices.

Compared with other children, those from families whose mothers considered healthfulness an important criterion for selecting foods consumed diets significantly lower in calories, fat, saturated fat, and sucrose and higher in fiber and vitamin A (*15*). Oliveria et al., examining the relationship between nutrient intakes of parents and their 3- to 5-year-old children participating in the Framingham Children's Study, found a modest but significant association between parents' and children's intakes for most nutrients (*37*). The association was stronger between mothers and children than fathers and children, and the strength of the association increased with the number of meals parents consumed at home.

Stanek (*47*) identified other parenting behaviors that were correlated positively with the nutrient adequacy (defined as number of servings from the major food groups) of the diets of 2- to 5-year-olds:

- Having the child prepare food or set the table.
- Allowing the child to make decisions about the type of food eaten.
- Giving small portions when serving a new food.
- Using discussion versus other techniques to persuade the child to eat.
- Forcing the child to eat a few bites of a food.
- Praising the child for eating healthful foods.



Stanek also found a positive correlation between the quality of the home environment (measured as degree of cohesion, expressiveness, and conflict within the family) and the nutrient adequacy of the children's diets. Children who ate with parents, siblings, or both at mealtime also had better diets, defined as more servings from the five basic food groups.

Effects of Maternal Employment on Children's Dietary Behavior

Maternal employment is another factor that has been studied in relation to family food consumption patterns and children's diets in the United States. Kirk ranked, from most important to least important, influences on working mothers' food choices for their families: Nutrition, time, catering to family members' desires, budget, management and organization, health, season and weather, and socialization (*30*). Johnson concluded that increased time pressure was one of the most significant factors affecting children's food choices: in general, the more hours women work outside the home, the fewer hours they spend preparing meals and the more meals their children eat away from home. This increase in away-from-home eating, however, represents primarily meals eaten in schools and child-care centers, which often have a positive effect on children's overall nutrient intakes. Negative effects of maternal employment on children's dietary status have not yet been identified (*28*).

Family Influences on Other Aspects of Children's Dietary Behavior

Investigators have examined how families affect children's attitudes toward nutrition, awareness of nutrition, the time they spend eating, and their ability to regulate their energy intake. Gillespie and Achterberg (*23*) found, among

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parents participating in a nutrition education program, more positive attitudes toward nutrition and higher scores on an instrument measuring family interactions. Parents participating in the nutrition education program, compared with other parents, also reported discussing food and nutrition topics with their families more frequently. Involving children in food-related decisions and activities can increase their awareness of nutrition and bring about changes in dietary behavior. Anliker found that both the quantity and specificity of parents' messages about foods were correlated positively to children's nutrition knowledge (*1*).

Klesges, in studies of the effects of parental influences on preschool children's food selections , found that parental encouragement to eat was correlated positively with the amount of time children spent eating (*33,34*). Both actual and threatened parental monitoring of food choices for a given meal had a marked effect on children's food selections by lowering total calories and sugar content of the meal.

Young children's ability to regulate their total energy intake is well documented (*7,44*), although children vary tremendously in what and how much they eat. Johnson and Birch examined the relationships among 3- to 5-year-old children's eating behavior, adiposity, and familial factors: such as parents' adiposity, eating style, diet history, and child-feeding practices (*29*). The results of their study: individual differences in ability to self-regulate energy intake were related to adiposity, with the fattest children being the least precise in this regulation. This is particularly pronounced in girls (*6*). Children who were the least responsive to the energy content of their diet also had parents who reported using the most rigid controls over their children's eating.

Another study, with 3-year-olds, found that the children with more control over food choices were significantly more aware of the role of foods in energy balance, and those children who were more involved in food-related activities had significantly higher levels of nutrition awareness (*1*). The study also found that the mothers of these children had some similar characteristics: they were more educated, more permissive, and employed outside the home.

Child-Care Programs and Children's Dietary Behavior

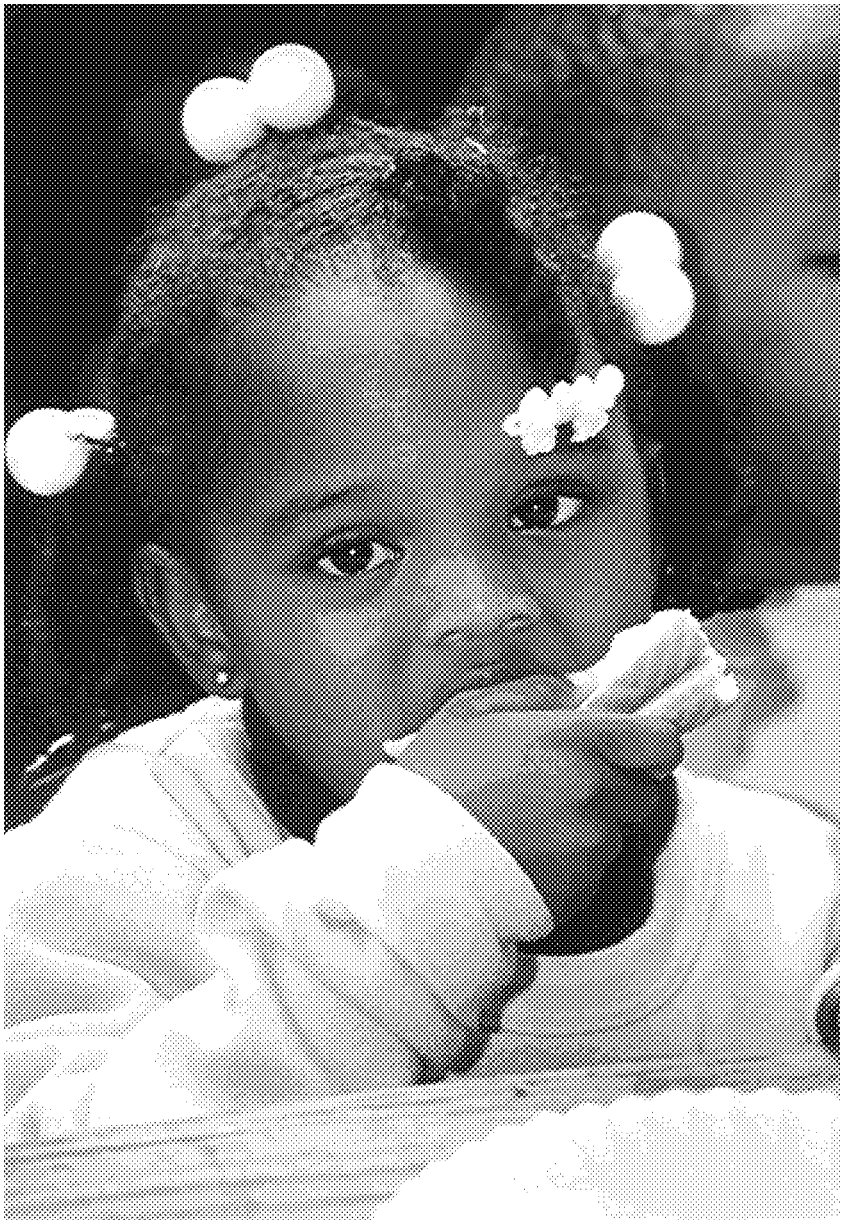
The nutrient contribution of foods served and the food choices by children in child-care settings have a substantial effect on the overall quality of children's diets. Briley et al. (*12*) found that the nutrition knowledge and practices of food service personnel in child-care settings had a major influence on the menus served there. USDA's 1997 evaluation of the food preparers of the Child and Adult Care Feeding Program (CACFP)[1] found that they had a reasonably good understanding of general nutrition and Dietary Guidelines principles (*22*). The combination of meals and snacks offered by CACFP providers supplied more than half of the RDA for energy and two-thirds of the RDA for other key nutrients (*22)*. However, earlier research studies conducted on-site at several licensed child-care centers found that menus did not meet children's nutrient requirements consistently, even

[1]CACFP provides Federal funds for meals and snacks served to children in nonresidential day-care centers. CACFP has established minimal meal-pattern requirements for child-care providers; it specifies both meal components and minimal portion sizes according to children's age *(22)*.

when CACFP meal-pattern requirements were followed (*10,17,19*). Nutrients reported below 50 percent of the RDA in menus designed for preschoolers at certain sites included calories, iron, zinc, and vitamin A (*10,12,17*). In addition, menus often exceeded recommended guidelines for fat, saturated fat, and sodium.

Another study conducted in family day-care homes in Texas found that menus were adequate for all nutrients, except iron; however, adequacy depended in part on serving amounts of foods that were twice the minimum serving required by the CACFP (*11*). Studies prior to USDA's 1997 study had identified numerous gaps in providers' knowledge of nutrition that affected the nutrient adequacy of meals and snacks that were served (*10,11,12,19*).

Other factors that influence what is served to young children at child-care centers include requirements of the food program, staff perceptions of children's food preferences, history of the food programs at the center, and cost (*12*). Studies reveal that centers sometimes failed to serve required portions of foods because providers did not believe children would eat the whole amount (*12*). In general, providers rarely talked with the children about the sources of food or it's benefit to them. They, however, did coax children to eat their meals and snacks.



Food and nutrition practices in child-care programs extend beyond what foods children are served. Nahikian-Nelms examined the nutrition knowledge, attitudes, and behaviors of caregivers in child-care settings to determine whether attitudes and behaviors thought to be important in the development of good eating habits were typically practiced (*36*). Results indicated that while caregivers held beliefs that were expected to have a positive effect on children's dietary behavior, caregivers also engaged in mealtime behaviors that were inconsistent with their beliefs and experts' recommendations. For example, caregivers sometimes failed to dine with children, or they consumed foods that were different from those being consumed by the children. Also, mealtimes were often dominated by caregivers' rule-setting behaviors that precluded any opportunity to discuss food and nutrition topics with the children.

Conclusions

This literature review, focusing on children's dietary practices, complements the findings from the other components of the USDA project to develop a food guide for young children (*35,43,49*). Overall, the review indicates associations between young children's food preferences and the food-related practices of their parents and caregivers.

Parents, caregivers, and nutrition educators have significant roles in helping children develop healthful food-related behaviors. Findings indicate that parents and child-care providers should choose developmentally appropriate foods, provide structured meals and snacks, and ensure a pleasant eating environment. Parents and caregivers must be persistent and patient in offering children a variety of both new and familiar foods to promote children's acceptance of new foods. Child-care providers, important co-participants with parents in helping children learn about and practice healthful eating habits, are responsible for making a variety of nutritious foods available and for serving as role models for the children in their care.

Helping parents understand the importance of learning and experience in the formation of children's food preferences may enable them to foster development of healthful eating patterns and lessen their anxieties about child feeding. Nutrition educators can help parents and caregivers of young children identify and develop appropriate food-related behaviors, as well as teach them how to avoid undesirable ones. Educators should carefully assess parents' and caregivers' needs in developing programs or materials for them and their children. Topics that may be appropriate for discussion range from food composition and nutrient needs to stages of child development and family communication skills.

The Food Guide Pyramid for Young Children 2 to 6 Years Old (*50*) was developed as a tool for parents and caregivers to use both to feed young children and to communicate food and nutrition messages to them. It was developed with focus group input from both parents and caregivers about the nutritional needs of young children and key concerns and barriers to meeting those needs at home and in the child-care setting.

Materials that accompany the adapted food guide highlight several of the findings from research on children's dietary practices, including (1) the importance of offering children a variety of foods to meet their nutritionl needs; (2) the need to introduce and continually reintroduce the same foods to children; (3) the principle that parents and caregivers are responsible for offering children nutritious food choices, while children are responsible for deciding what and how much they eat; (4) the importance of being flexible with amounts of foods served at a given eating occasion; and (5) the need to involve all family members in making healthful food choices. The Food Guide Pyramid for Young Children also stresses the importance of role modeling and the need for parents and caregivers to work together to improve children's dietary habits. Numerous practical tips and hands-on, developmentally appropriate activities are provided to help parents and caregivers introduce food-preparation skills to young children.

Focusing on changing what children like to eat through repeated exposure to healthful foods and parental and community involvement in modeling healthful eating behavior is more likely to be effective in reaching young children than simply teaching to increase nutrition knowledge (*25*). To be successful in promoting and reinforcing diets consistent with the Dietary Guidelines and the Food Guide Pyramid, nutrition educators and programs need to target all environments of the preschool child—home, school, and community (*42*).

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